MEMORANDUM DAQC-2120-96

TO: **FILE - THATCHER CHEMICAL COMPANY**

THROUGH: Jeff Dean, Compliance Manager

FROM: Jay Morris, Environmental Scientist
Anthony DeArcos, Environmental Scientist AD
Norm Erikson, Environmental Scientist nak

17715AIR

SS1U/1R

DATE: December 22, 1996

SUBJECT: **THATCHER CHEMICAL COMPANY**, B, NA, Toxics, Salt Lake County, AIRS # 03500119

TYPE OF INSPECTION: Stack test

DATE OF INSPECTION: November 20, 1996

MULTIPLE INSPECTION SOURCE (yes or no): No

SOURCE LOCATION: 1905 West Fortune Road, SLC / Salt Lake County / Utah

SOURCE CONTACT(S): Bruce Bastian, Industrial Hygienist
Dale Hansen, Environmental Affairs
Gary Hammond, Senior Engineer
Todd Mikalas, Operator
John Hoffman, Operator

OPERATING STATUS: Operating

PROCESS DESCRIPTION: Thatcher manufactures liquid SO2 in building # 12. Elemental sulfur is stored in a silo where it is heated to a molten state. The molten sulfur is atomized and injected into the burner where it combusts, creating SO2 gas. The gas is cooled in a cooling tower, sent through an absorber where it is absorbed by water and then separated from the water in a pure form in the stripper. From the stripper, the gas is condensed and dried in a series of 3 drying towers. After drying, the gas is sent through a mist eliminator, compressed and sent to either train or truck storage.

APPLICABLE REGULATIONS: Approval Order dated September 21, 1994, Condition 19-C
ORDER TO TEST dated September 6, 1996

SOURCE INSPECTION EVALUATION:

Pretest Protocol submitted on October 17, 1996
Pretest Protocol additional information received on November 11, 1996

pH meter calibration data: the analyzer was tested against a known solution of pH 7 and pH 10. Certifications for these solutions are included with this report. The following is the information gathered during the calibration of the pH meter:

test time	actual value	observed value	difference
9:00-9:15 am	7.0	7.0	0.0
	10.0	10.08	0.08
1:35-1:45pm	7.0	7.0	0.0
	10.0	10.03	0.03

Monitor is considered calibrated if readings are within +/- 0.1 pH of actual value.

Draeger samples were taken at depths of 3", 6" and 9" into the 12" stack. The high moisture content in the stack accelerated the reaction of the Draeger tube according to the AMC's Bruce Allen. The results were as follows:

time	reading	depth into stack
9:50am	~15ppm	9 inches
9:58am	~12ppm	6 inches
10:04am	~10ppm	3 inches

The Draeger tubes used are only accurate in the range of 20 - 200 ppm. A copy of the adjusted barometric pressure corrections conducted by DAQ's Bruce Allen is included. According to Mr. Allen, no corrections needed to be made to the actual readings.

Samples of product were not taken during this inspection. Copies of the liquid SO2 analysis (conducted on the storage container that product is pumped into, prior to filling), the molten sulfur laboratory analysis report (product received) and the certificate of analysis for the final SO2 product are included with this report.

Operators running the process were Todd Mikalas and John Hoffman. Both have been trained and were able to answer questions concerning this facility. Both operators verified that the process was operating normally during this inspection. The following is the process information gathered during the stack testing process:

SCRUBBER

time	flow (GPM)	pH	pump pressure (PSI)
9:00 am	77.5	7.1	19
10:45 am	81.3	7.5	18
12:00 pm	82.0	7.5	18
12:46 pm	81.0	7.5	19
1:30 pm	80.6	7.5	19
2:30 pm	80.5	7.0*	19

* the test had finalized and the pH was being lowered to establish the correlation between pH and ppm SO2 leaving the stack. The correlation was made and the results are attached. Thatcher emits 50 ppm SO2 when the pH drops to 6.1 (see attached results). This figure will be used as the minimum pH Thatcher will be allowed to operate at in the company's new AO.

BURNER TEMPERATURE

time	temperature in degrees F
8:45 am	2060
10:55 am	2056
12:00 pm	2116

12:46 pm	2113
1:30 pm	2121

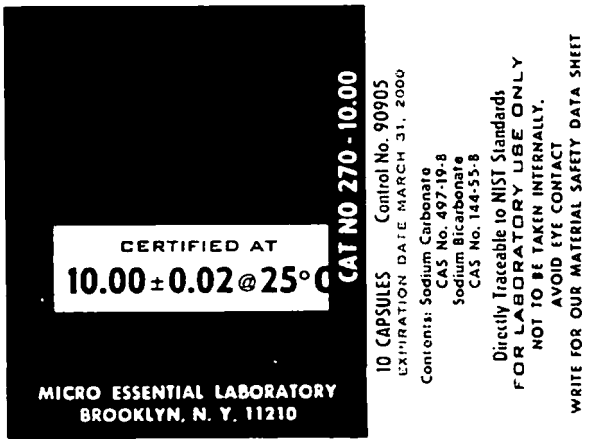
Both operators confirmed that the burner temperature is 2000 - 2200 degrees F when the facility is operating normally.

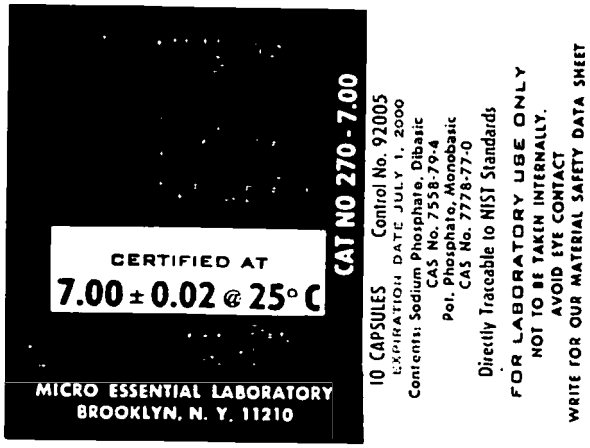
TITLE V SOURCE:	No.
EMISSION CAP AND EVALUATION:	Thatcher has no emission cap.
EMISSION INVENTORY:	This test will be used to calculate emissions for this facility in Thatcher Chemicals new AO.
SOURCE INSPECTION SUMMARY EVALUATION:	Thatcher produced 13,800 pounds of liquid SO2 during the test and was operating normally.
CURRENT RECOMMENDATIONS:	Recommendations will be made following a review of the stack test results.
RECOMMENDATION FOR NEXT INSPECTION:	Thatcher is in the process of obtaining a new AO. Check to see if the AO is issued or not.
ATTACHMENTS:	pH 7 & 10 certifications Correction factor calculations for Draeger tube readings Contamination test (for containers SO2 is pumped into) Molten Sulfur laboratory analysis SO2 certificate of analysis pH/ppm correlation
INSPECTORS SIGNATURE:	

THATCHER COMPANY P.O. B[illegible] 27407 SALT LAKE CITY, UTAH 841[illegible]

(801) 972-4587
FAX (801) 972-4606

CHEM





From: Bruce Allen
To: EQAIR.JMORRIS, EQAIR.NERIKSON
Date: 11/20/96 11:36am
Subject: F FACTOR FOR DRAEGER TUBE PRESSURE CONVERSIONS

The sea-level adjusted barometric pressure as of 10:45 a.m. on 20 November at the Salt Lake Airport was 1.012 millibars which converts to 1010 hPa. (1.012 mb x 760 mm Hg/1.013 mb x 133 Pa/1mm Hg x 1 hPa/100 Pa)

F = 1013/1010 = 1.003 or essentially unity. **So the readings we took multiplied by F are the concentrations we read from the Draeger tubes.** No correction is needed.

THATCHER COMPANY TECHNICAL SERVICES REPORT SHEET LIQUID SULFUR DIOXIDE

DATE _____

SO_2 Sample No.	Time & Location of Sample	Acid Sample I.D.	% Acid	Sign & Date
1	12:45 Comineo		—	AK 11/18
2	21:15 Production		—	AK 11/18/96
3	17:30 Production			AK 11/20/96

WATER (mg/Kg)

Sample No.	Sample Size g	Liquid Sulfur Dioxide Appearance	Reagent Titer (g/ml)	Reagent (ml)	Test Results (mg/Kg)	Chemist & Date
1	133	Hazy	0.007	1.96	104	AK 11/18
2	209.7	Clear	0.007	0.83	28	AK 11/18
3	238	Clear	0.007	1.55	46	AK 11/20

RESIDUE (mg/Kg)

Sample No.	Sample Size (g)	Flask No.	Tare Weight (g)	Final Weight (g) AK	Residue (g)	Residue (mg/Kg)	Chemist & Date
1	153.1	4	79.8403	79.8460	0.0057	38	AK 11/18
2	204.7	6	74.7895	74.7900	0.0005	<5	AK 11/18
3	201.0		97.7503	97.7561	0.0058	29	

SULFURIC ACID (mg/Kg)

Sample No.	Sample Size (g)	NaOH Normality	NaOH ~~(ml)~~ g	H_2SO_4 (mg/Kg)		Chemist & Date
1	153.1	0.052	0.54	10		AK 11/18/96
2	204.7	0.052	0.17	<5		AK 11/18/96
3	201	0.052	1.22	16		

COMMENTS:

1) Residue: Stringy sulfur smell / appearance.

3) Clear

LABORATORY APPROVAL OR REJECTION

Product Approved By: _____ Date: _____

Product Rejected By: _____ Date _____

FORM APPROVED BY:

LaboratoryMgr. Jerry Buttle Date 29 July 93

Q.A. Mgr. Hugh Morgan Date 29 Jul 93

COPY MADE AND CHECKED BY:

_____ Date _____

SAYBOLT INC.

SAYBOLT

HICAGO, IL OFFICE

CUSTOMER
REF. NO(S) :

DATE : 12/29/94

LABORATORY ANALYSIS REPORT

LABORATORY NO. : 13436

INVOICE NO.:ID-21379A

DESCRIPTION

Sample designated as :
MOLTEN SULFUR

Identifying Marks :
TRAIN 1, WHITNEY CANYON
AS PLANT, EVANSTON, WY
4th QUARTER SAMPLE

Submitted by :
AMOCO PRODUCTION CO.

Client :
AMOCO PRODUCTION CO.

NOTES

- This laboratory report may not be published or used except in full. shall not be used in connection with any form of advertising unless written consent is received from an officer of SAYBOLT INC.
- Results were based on analysis made at the time samples were received at the laboratory.
- Samples, if any, shall be retained for a period of 45 days unless a longer period is requested in writing.
- Sample nomenclature is designated the customer.

ANALYSIS

TEST	METHOD	RESULT
SULPHUR, WT PCT	CALC.	99.97
CARBON, WT PCT	T.G.S.M.	0.025
ASH, WT PCT	T.G.S.M.	0.0017
ACID, PCT AS H2SO4	T.G.S.M.	0.0004
ARSENIC, PPM	AA/MHS	< 1
SELENIUM, PPM	AA/MHS	< 1
TELURIUM, PPM	AA/MHS	< 1

MEMBERS ASTM-API-SAE

THATCHER COMPANY P.O. BOX 27407 SALT LAKE CITY, UTAH 84

(801) 972-4587
FAX (801) 972-4606

CHEM

CERTIFICATE OF ANALYSIS

To: Sacramento City
Lot No: 96-9076
Date: October 31, 1996
Rail Car No: UTLX 82605

Sulfur dioxide of the above lot no meets the following specifications:

SO_2 Content	99.9% minimum
Water	22mg/Kg
Non volatile residue	14 mg/Kg
H_2SO_4	11 mg/Kg

Thank You
Thatcher Company

pH / ppm Corelation

Thatches

11/20/96

pH	PPM	Time
7.8	~~3.4~~ 1.7	1355 hrs.
7.7	2.5	1357
7.6	1.2	1400
7.5	1.0	1406
7.4	0.9	1409
7.3	1.0	1413
7.2	1.2	1418
7.1	1.3	1424
7.0	1.8	1429
6.9	2.6	1437
6.8	3.8	1444
6.7	5.4	1452
6.6	8.5	1502
6.5	12.8	1513
6.4	18.4	1524

77° F

PH ~~PPM~~	PPM	Time	
6.3	27.3	15:37	
6.2	38.2	15:48	Not Good #s
6.2	38.6	15:54	
6.[illegible]	50.1	16:04	

MEMORANDUM

DAQE-2190-96 Jay

To: **FILE - THATCHER COMPANY**

Through: Jeff N. Dean, Compliance Manager JD

From: Anthony DeArcos, Environmental Scientist AD

Date: December 20, 1996

Subject:
Company: **THATCHER COMPANY**, (B), Salt Lake County
Location: Salt Lake City, Utah
Source: Sulfur Dioxide Scrubber
AIRS #: 035-00119
AO #: DAQE-078-94,dated September 21, 1994
Subject: Stack Testing

FINDINGS

1) On November 20, 1996, Thatcher Company conducted stack testing to demonstrate compliance with the emission limits stipulated in Condition 19.C. of an AO dated September 21, 1994.

2) The testing included EPA Method 6C to determine the emissions of SO2 from the stack.

3) Visible Emissions Observations were performed during the stack tests in accordance with 40 CFR 60, Appendix A, Method 9. The average for the readings was 8.26%, within the Approval Order limit of 15% opacity.

4) The testing also appears to have met the minimum performance criteria set forth by UACR and EPA Methods, therefore the results of the testing demonstrates that at the time of testing this source was in compliance with the emission limitations set forth in Condition 19.C. of the above mentioned AO. The results are presented below:

	TEST RESULTS	***AO LIMITS***
Sulfur Dioxide Scrubber		
SO2	**0.97 ppm**	**50 ppm**
	0.01 lbs/hr	**0.3137 lbs/hr**

PROBLEMS

1) A review of the data submitted in the test report submitted by American Environmental Testing Company, Inc., for Thatcher Company revealed no omissions, errors, or problems. However, there is some confusion caused by the report from American Environmental Testing Company, Inc. The report refers to the testing site as the "Sodium Dioxide Scrubber" rather than the "Sulfur Dioxide Scrubber" numerous times.

RECOMMENDATIONS

1) Thatcher Company should be considered in compliance with Condition 19.C. of the September 21, 1994, AO.

2) No further action is necessary at this time.